

# Minnesota 2025 Energy Action Plan

**Stakeholder Meeting 2 | September 22, 2015**

Erik Fowler and Christa Owens, Rocky Mountain Institute  
Lise Trudeau, Minnesota Department of Commerce

[Start Here](#)



# Recap of Groups' Prioritized Topics from Last Meeting

---

- Mobility/Transportation
- Energy Supply & Grid Modernization
- Efficient Buildings & Thermal Energy
- Industry (including Agriculture)
- Energy & Climate Action Planning



# Key points to consider in prioritizing initiatives/topic focus area

- Taking advantage of technology innovation
- Enabling customer choice
- Meeting MN's current policy goals (a couple mentioned below):
  - GHG goals: 20% below 2005 levels by 2025 and 80% by 2050
  - 25x25 goal: 25% of energy from renewables by 2025 and reduce per-capita fossil fuel use 15% by 2015
  - EERS: annually conserve 1.5% of retail electricity and 1% of natural gas sales
- An eye for initiative synergies?



# Mobility/Transportation

---

- Electrification of mass transit (bus fleets, rail already is)
- Fleet electrification or low-emission AF vehicles (city, state, corporate fleets)
- Increase adoption of EVs/AFVs
- Modernizing parking infrastructure to reduce VMT (vehicle miles travelled)\*
- Regionally coordinated mass transit



# Mobility/Transportation

---

## 1. Electrification of mass transit (bus fleets)

- Opportunity: potential for significant cost savings over the asset period, reduced fuel costs, improved air & noise quality, paybacks in some cases 2-3 years
  - Aligns with policy goals (GHG, others?)
- MN status & Examples:
  - Duluth is reportedly purchasing 6 (and has one charger)
  - 15% of metro Twin Cities bus fleet is hybrid/diesel-electric
  - Twin Cities & St. Cloud have some CNG buses



# Mobility/Transportation

---

## 1. Electrification of mass transit (bus fleets)

### – Drivers/Barriers/Issues:

- Economic advantage
- Cold weather
- Range
- Financing
- Charging infrastructure
- Current MN grid fuel mix and emissions impacts?

### – Actionable Next Steps:

- ?



# Mobility/Transportation

---

## 2. Fleet electrification or low-emission AF vehicles\*

- Opportunity: higher utilization rates with more predictable routes, potential for significant cost savings over the asset period including reduced fuel costs, improved air & noise quality.
  - Aligns with policy goals (GHG, others?)
- MN status:
  - Drive Electric Minnesota is a partnership of local and state government, utilities, business + nonprofit to bring electric vehicles and charging infrastructure to MN\*
- Examples:
  - Los Angeles committed to leasing 160 EV's for city fleet (now largest city EV fleet in U.S.) and 128 plug-in hybrids with projected operating cost reduction of 40%, enabling self-financing.
  - Houston organized all EVs for City under one department, 3<sup>rd</sup> largest U.S. fleet



# Mobility/Transportation

---

## 2. Fleet electrification or low-emission AF vehicles\*

### – Drivers/Barriers/Issues:

- Economic advantage
- Cold weather
- Range
- Financing
- Charging infrastructure
- Different city departments manage different vehicles (including procurement vs. operations)
- Current MN grid fuel mix and emissions impacts?

### – Actionable Next Steps:

- ?



# Energy Supply & Grid Modernization

- Encourage evolution of integrated/smart grid
- Expand/improve utility green power options
- Address metering infrastructure and smart inverters
- Expand distributed generation and management of grid resources
- Evolving tariffs/pricing mechanisms



# 1. Integrated/smart grid

---

## Definition\*:

An integrated grid is one that optimizes the power system while providing safe, reliable, affordable, and environmentally responsible electricity.

## •Opportunity:

- New business opportunities
- More efficient grid utilization and reduced overall costs
- Better integrated of distributed energy resources (DER: solar, storage, CHP, demand response, EVs, efficiency, etc.)
- Increased grid resilience and intelligence
- Aligns with policy goals (GHG, RPS, efficiency, others?)

\*Source: EPRI



# 1. Integrated/smart grid

---

- MN status:
  - Minnesota PUC inquiry into Electric Utility Grid Modernization with a focus on Distribution Planning (PUC Docket Number [CI-15-556](#))\*. Meetings 9/25, 10/30, 11/20
  - The Minnesota e21 Initiative aims to develop a more customer-centric and sustainable framework for utility regulation that aligns with how utilities earn revenue given public policy goals, new customer expectations, and the changing technology landscape.\*
  - Integrated/Smart grid projects at Arden Hills (Rice Creek Commons), former Ford manufacturing plant in St. Paul, and Great River Energy/Lake Region Electric Cooperative, and Minnesota Valley Electric Cooperative



# 1. Integrated/Smart Grid

---

- Drivers/Barriers/Issues:
  - Evolving public policy on de-carbonization, resiliency, reliability, and security
  - Aging infrastructure & needed investment for a more flexible, responsive system
  - Customer demands for more control, information, choice
  - Interconnection rules and technology communication standards
  - Smart/advanced inverters (enabling technology)
  - Funding
- Other Examples:
  - Massachusetts Grid Modernization Proceeding (D.P.U. 12-76-B)
  - NY REV proceeding
- Actionable Next Steps:
  - ?

## 2. Utility green power options

- Definition: “voluntary” or “green power” options are those where customers voluntarily purchase renewable energy for all or part of their electricity needs.
- Opportunity: 60% of the largest US business (including Target and 3M) have set public climate and renewable energy goals, and green power markets provide an avenue to satisfy these.
  - Utilities may provide “trusted partner” status to vet renewables projects to meet customer needs through a green tariff
  - Green tariffs have the advantage of opening up a customer class, such as large business, for utility-sourced renewables (rather than special, individualized contracts)
- MN Status:
  - All utilities in MN offer traditional green power options
  - Webinar to revisit green power options in Minnesota planned for Oct. 28, 2015 (time TBD) and to include experts on program design, corporate customers, stakeholders, etc.



# 2. Utility green power options

---

- Drivers/Barriers/Issues:
  - Designing green tariff/green pricing program so that it meets customer needs and results in significant adoption
  - Addressing risks and concerns of utilities such as managing risk of stranded RE assets\*
  - Avoiding cost-shifts to nonparticipating customers
- Other Examples:
  - Green tariffs: Puget Sound Energy (WA), Duke Energy (NC), Dominion Power (VA)
  - Green pricing: Austin Energy (long-term contract,) Xcel (fuel cost credit), GRE (EV program)
- Actionable Next Steps:
  - ?



# Efficient Buildings and Thermal Energy

- Scale EE in existing buildings
- Pilot behavioral strategies
- Support distributed generation & **Combined Heat & Power (CHP)**
- Analysis of current programs that are working well or to improve (persistence in savings)
- Zero energy or low-energy goals for new buildings (projections needed)
- Advanced grid and thermal grids

# Industry (including Agriculture)

---

- CHP
- Commercialize advanced biofuels and biobased chemicals
- Capture organic feedstocks through anaerobic digestion
- Promote industrial efficiency practices



# Combined Heat & Power

---

- A definition:
  - **The concurrent production** of electricity or mechanical power and useful thermal energy (heating and/or cooling) from a single source of energy.
  - **Can be centralized or distributed generation**, and is located at or near the point of consumption.
  - **A suite of technologies** that can use a variety of fuels to generate electricity or power at the point of use, allowing the heat that would normally be lost in the power generation process to be recovered to provide needed heating and/or cooling.

Aka CHP or cogeneration, DOE definition



# CHP

- Opportunity:

- More than two thirds of the fuel used to generate power in Minnesota is lost as heat.
- Waste heat equal to 83 percent of the state's total requirement for heat energy in buildings and industry.
- Recent tech/economic study revealed potential to double current capacity in MN (currently at 962MW installed)
- Alignment with policy goals
- Energy efficiency, environmental quality, grid resiliency, and peak demand management
- Potential to consider a specific bioenergy CHP carve-out in the existing state RES/RPS, or expanding the current RPS to include provisions for CHP



# CHP

- MN Status:

- 962 MW of CHP located at 52 sites across MN. 83% reside in large systems (>20 MW). 70% are in industry, 19% are in district energy. Of note: 34% are coal, 38% are natural gas
- MN Department of Commerce developed a draft action plan for CHP deployment in the state (2015). The final action plan is expected to be released December 2015.
- CSEO has also analyzed the potential for CHP to reduce greenhouse gas emissions, finding that wide-scale implementation could result in 46 million metric tons of CO2 reductions from 2015-2030



- Drivers/Barriers/Issues:
  - High capital costs of CHP projects may be a barrier to investment.
  - Interconnection standards
  - No market for GHG emissions, power grid resiliency, etc.
  - Many industrial and commercial entities lack the experience, skills, and time to develop a CHP project.
  - Compliance with EPA Clean Power Plan
- Leading Examples:
  - St. Paul/Evergreen Energy district energy system\*
  - The Texas Medical Center/Thermal Energy Corporation (Houston)
- Actionable Next Steps:
  - ?

## **MN Commerce Draft CHP Action Plan – Priority issues**

- 1. Standby Rates (2016-2017)** - Continue stakeholder engagement through MN PUC generic proceeding on standby rates
- 2. CHP Evaluation Methodology and Criteria (2016-2017)** - Establish CHP Energy Savings Attribution Model
- 3. Mapping CHP Opportunities (2016-2017)** - Map CHP opportunities at wastewater treatment and other public facilities
- 4. CHP Ownership Problems and Solutions (2015-2016)** - Leverage existing financing programs applicable to CHP
- 5. Education and Training Needs and Options (2015-2016)** - Expand education and training resources
- 6. Adapting CIP for Supply-Side Investments (2017-onward)** - Develop and clarify electric utility infrastructure policy Long-term



# Energy & Climate Action Planning

---

- Reform the utility regulatory model
- Start clean-tech cluster organization
- Local and state government sustainability and climate action planning
- Regular state level planning to support/encourage local action
- Monetize the value of externalities



# Community led sustainability, climate, and energy planning

- **Cities and communities are often on the leading edge of innovation with respect to clean energy initiatives.**
- Some leaders set binding goals on GHG emissions as a larger planning goal, along with other sustainability and energy goals.
- Innovative transportation and land use changes, emphasize quality of life, local investment, clean energy jobs, reduced emissions, and more.
- Examples of these include Fort Collins, Colorado; Palo Alto, California; Duluth, Minnesota; Minneapolis, MN, and many others.
- Essential impact areas are (big 4 buckets):
  - **Transportation/mobility** (reduce VMT, increase EV and AFVs)
  - **Electricity/energy supply** (work to expand customer choice, expand renewables – especially distributed resources (e.g. rooftop solar), etc.
  - **Building efficiency** (old and new)
  - **Other efficiency:** promote industrial efficiency, CHP, district energy, water system efficiency, etc.



# Local community planning best practices\*

- **Leading practice 1:** Developing a transparent & collaborative planning process
- **Leading Practice 2:** Effective stakeholder collaboration & community engagement
- **Leading Practice 3:** Analyzing + effectively communicating the energy landscape
- **Leading Practice 4:** Carefully consider broad system enablers
- **Leading Practice 5:** Assess current & future initiatives by sector
- **Leading Practice 6:** Cities typically “lead by example” for public assets, examples:
  - Building retro-commissioning (RCx “tune up”) initiative for all qualifying buildings
  - energy benchmarking and disclosure requirements
  - disclosed energy audits at time of sale of lease
  - minimum green energy sourcing requirements
  - LEED certified or higher for new buildings
  - innovative behavioral efficiency pilots (energy conservation)
  - Fleet electrification and/or low-emission vehicle procurement strategies
  - Working with utilities to expand green power and efficiency offerings (some considering other alternatives)

\*National surveys



# Some Minnesota resources to augment local community planning

---

- Minnesota's [Green Step Cities](#) is a voluntary challenge, assistance and recognition program to help cities achieve their sustainability and quality-of-life goals.
- Potential to collaborate with [Minnesota CERTS](#) (Clean Energy Resource Teams), a statewide partnership with a shared mission to connect individuals and their communities to help identify and implement community-based clean energy projects.
- Minnesota's [CSEO Initiative](#) (Climate Solutions and Economic Opportunities) is an initiative led by the EQB. Evaluates Minnesota specific strategies from across Minnesota's economy for their potential to reduce harmful greenhouse gases that contribute to climate change, and for their potential to grow our economy.
- Minneapolis [Climate Action Plan](#).

